

Motor Pool Facility

Facility Environmental Monitoring Report

Calendar Year 2004



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Brookhaven National Laboratory Motor Pool Facility Environmental Monitoring Report Calendar Year 2004

Summary of Results

The solvents 1,1,1-trichloroethane (TCA) and 1,1-dichloroethane (DCA), and the gasoline additive methyl tertiary butyl ether (MTBE) continue to be detected in groundwater downgradient of Buildings 423/326 at concentrations that exceed regulatory standards. During 2004, TCA, DCA and MTBE were detected at concentrations up to 35 µg/L, 13 µg/L, and 18 µg/L, respectively.

The facility's underground storage tanks and associated distribution lines are not leaking and all waste oils and used solvents are being properly stored and recycled. Therefore, it is believed that the contaminants detected in groundwater originate from historical vehicle maintenance activities, and are not related to current operations.

Background

The Motor Pool (Bldg. 423) and Site Maintenance facility (Bldg. 326) are attached structures located along West Princeton Avenue (Figure 1). The Motor Pool area consists of a five-bay automotive repair shop, which includes offices and storage space. The Site Maintenance facility provides office space, supply storage, locker room, and lunchroom facilities for custodial, grounds, and heavy equipment personnel. Both facilities have been in continuous use since 1947.

Potential environmental concerns at the Motor Pool include the use of underground storage tanks (USTs) to store gasoline, diesel fuel, and waste oil; hydraulic fluids used for lift stations; and solvents used for parts cleaning. In August 1989, the gasoline and waste oil USTs, pump islands, and associated piping were upgraded to conform with Suffolk County Article 12 requirements for secondary containment, leak detection devices, and overfill alarms. During the removal of the old USTs, there were no obvious signs of soil contamination. The present tank inventory includes two 8,000-gallon USTs used to store unleaded gasoline, one 260-gallon above ground storage tank for waste oil, and one 3,000-gallon UST for Number 2 fuel oil.

The Motor Pool facility has five vehicle lift stations. The hydraulic fluid reservoirs for the lifts are located above ground. In February 1998, hydraulic fluid was observed leaking from one of the lift stations (BNL Spill Number 98-14). The lift was excavated and soil below the lift was contaminated with hydraulic oil. Approximately 50 cubic yards of the most contaminated soil were removed. Hydraulic oil products were not detected in groundwater samples collected from a monitoring well that was installed inside the building near the lift.

The only environmental concern associated with the Site Maintenance facility (Bldg. 326) was the December 1996 discovery of petroleum-contaminated soil from an historic oil spill directly south of the building (BNL Spill Number 96-54). The site was excavated to the extent that the footings of the building were almost undermined. Although approximately 60 cubic yards of contaminated soil were removed, there was clear evidence that contaminated soil remained. Four wells were installed to determine whether the spill had impacted groundwater quality. Although oil breakdown products were not observed in the wells, the solvent 1,1,1-trichloroethane (TCA) and gasoline additive methyl tertiary butyl ether (MTBE) were detected at concentrations above New York State Ambient Water Quality Standards (NYS AWQS).

Summary of Operations During 2004

During 2004 there were no reported gasoline or motor oil losses or spills, and all waste oils and used solvents generated from current operations are being properly stored and recycled. The gasoline USTs have electronic leak detection systems, and there is a daily product reconciliation (i.e., an accounting of the volume of gasoline stored in underground storage tanks and volume of gasoline sold).

Documentation for gasoline deliveries from suppliers delivering gasoline to the Motor Pool in 2004 had sufficient information to show that the gasoline received conformed with federal gasoline reformulation and detergent additive requirements and state VOC requirements.

Environmental Monitoring Program

In 1996 BNL established a groundwater monitoring program at the Motor Pool facility's gasoline UST area to evaluate potential impacts to environmental quality from gasoline storage and dispensing operations. This monitoring program was expanded in 1999 to evaluate potential impact from the previously described oil spill found near Building 326. The groundwater monitoring program for the Motor Pool facility is described in the *BNL Environmental Monitoring Plan* (BNL, 2004).

Monitoring Results

Underground Storage Tank Area

Two groundwater surveillance wells (102-05 and 102-06) are positioned downgradient of the UST/pump island area (Figure 1). Groundwater samples collected from the two wells in March and September were tested for volatile organic compounds (VOCs), and samples collected in September were tested for semi-volatile organic compounds (SVOCs).

During 2004, MTBE was the only VOC related to gasoline products detected in groundwater downgradient of the gasoline UST area (Table 1). Compared to 2003 when

MTBE concentrations reached a maximum of nearly 34 µg/L (the NYS AWQS is 10 µg/L), MTBE concentrations decreased to <2 µg/L by October 2004 (Figure 2). As in past years, low levels of the solvent TCA was also detected, but at concentrations that continued to be below the NYS AWQS of 5 µg/L. Wells 102-05 and 102-06 were also tested semiannually for the presence of floating petroleum hydrocarbons. As in previous years, no floating product was observed. No SVOCs were detected in the samples collected in September.

Monitoring of the UST leak detection systems and review of product reconciliation records indicate that the USTs and distribution lines are not leaking. MTBE was used as a gasoline additive from 1977 through early 2003, and has been detected at low levels in the Motor Pool wells since the groundwater monitoring program began in 1996. The detection of both MTBE and TCA is consistent with the contamination routinely detected in the nearby wells that monitor Bldg. 423/326 (discussed below), and the contamination is likely to have originated from historical spills near Bldg. 423.

Building 423/326 Area

Groundwater quality downgradient of the Building 423/326 area is monitored using four wells (102-10, 102-11, 102-12, and 102-13). The program is designed to periodically assess existing solvent contamination that resulted from historical vehicle maintenance operations, potential impacts from an old oil spill discovered in 1996, and to confirm that the current engineered and operational controls are effective in preventing additional contamination of the aquifer. Groundwater samples were collected from the four wells in October, and were tested for VOCs.

During 2004, TCA was detected in all four wells, at concentrations up to 38 µg/L (Figure 3). 1,1-dichloroethane (DCA) was also detected in wells 102-11, 102-12 and 102-13 at concentrations up to 13 µg/L. The gasoline additive MTBE was detected in all four wells, at concentrations up to 18 µg/L.

Future Monitoring Actions

The 2005 monitoring program will consist of:

- Continue to monitor wells located downgradient of the gasoline UST area on a semiannual schedule, and test for floating product and VOCs.
- Continue to monitor wells downgradient of the Building 423/326 area on an annual schedule, and test for VOCs.
- Staff Services Division will continue to review reconciliation records on a frequent basis.

References

BNL, 2004. *Brookhaven National Laboratory Environmental Monitoring Plan, CY 2004 Annual Update* (January 2004). BNL Report 52676.

Table 1. Groundwater Monitoring: Volatile Organic Compound Analytical Results for CY 2004.**Downgradient of the Gasoline USTs**

Well	Sample Date	1,1,1-Trichloroethane	1,1-Dichloroethane	Methyl tert-butyl ether
		Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
102-05	3/15/2004	0.85	<0.5	1.9
	9/14/2004	<0.5	<0.5	<0.5
102-06	3/15/2004	0.76	<0.5	1.5
	9/14/2004	<0.5	<0.5	<0.5
Typical MDL		0.5	0.5	0.5
NYSAWQS		5	5	10

Downgradient of Buildings 423/326

Well	Sample Date	1,1,1-Trichloroethane	1,1-Dichloroethane	Methyl tert-butyl ether
		Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
102-10	3/15/2004	6.8	<0.5	1.8
	9/14/2004	3.1	<0.5	0.44 J
102-11	10/13/2004	7.3	1.6	3.6
102-12	10/13/2004	35	13	15
102-13	10/13/2004	15	2.8	18
Typical MDL		0.5	0.5	0.5
NYSAWQS		5	5	10

MDL: Minimum Detection Limit – EPA Method 524.2 was used to analyze these samples.

J: Estimated Concentration

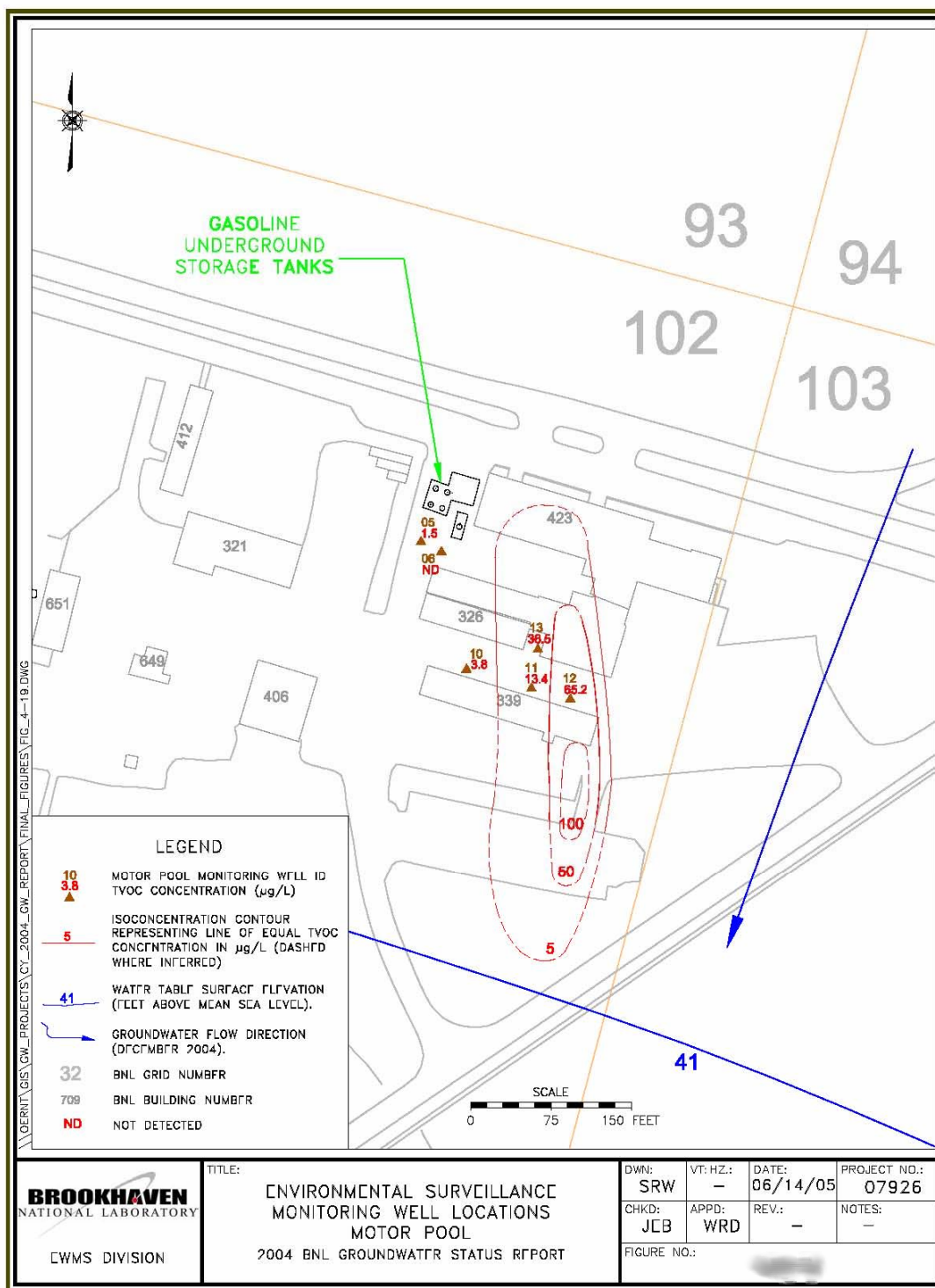


Figure 1: Locations of Monitoring Wells in the BNL Motor Pool Area.

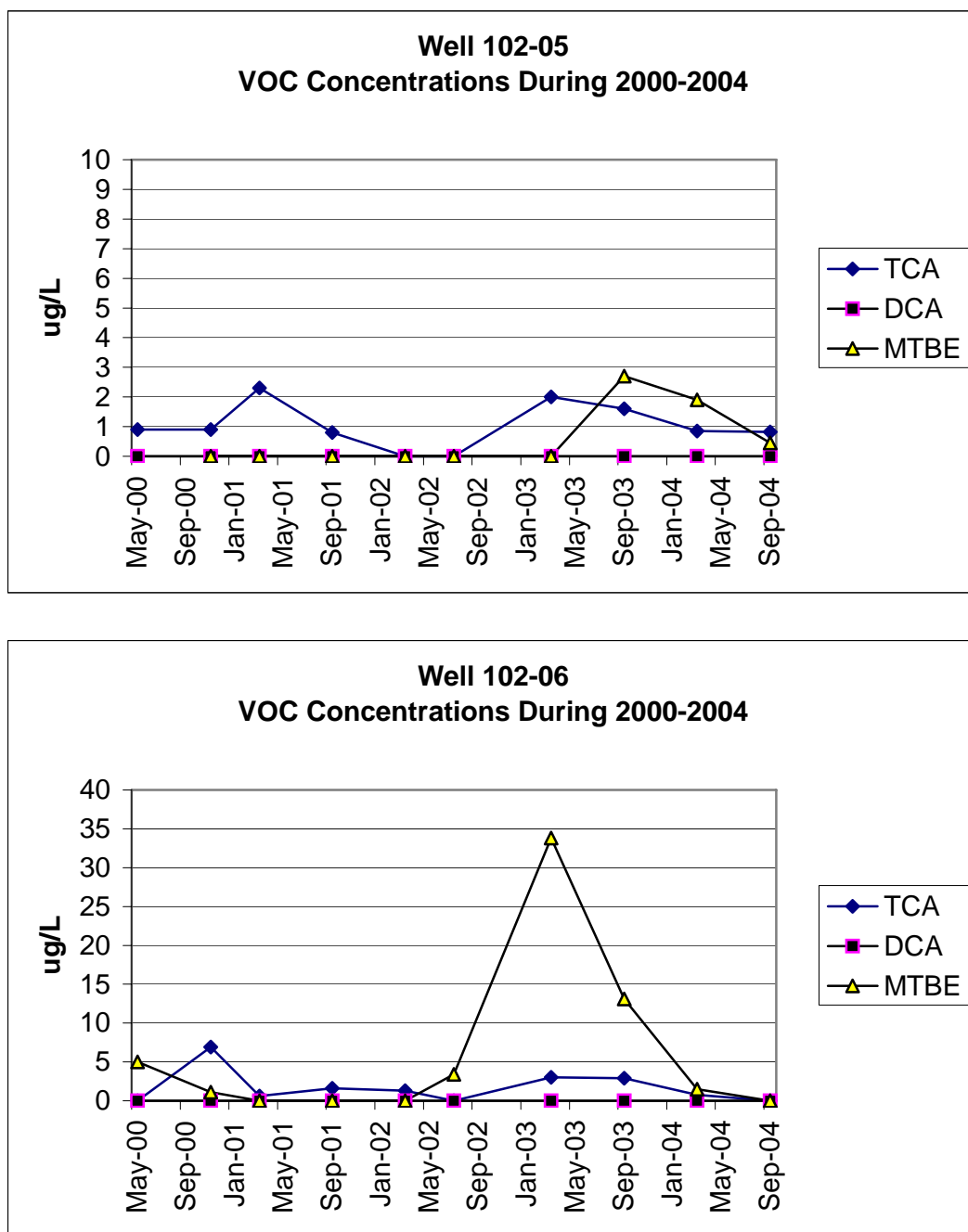


Figure 2: VOC Concentration Trend Plots for Monitoring Wells Downgradient of the Motor Pool's Gasoline UST and Pump Island Areas.

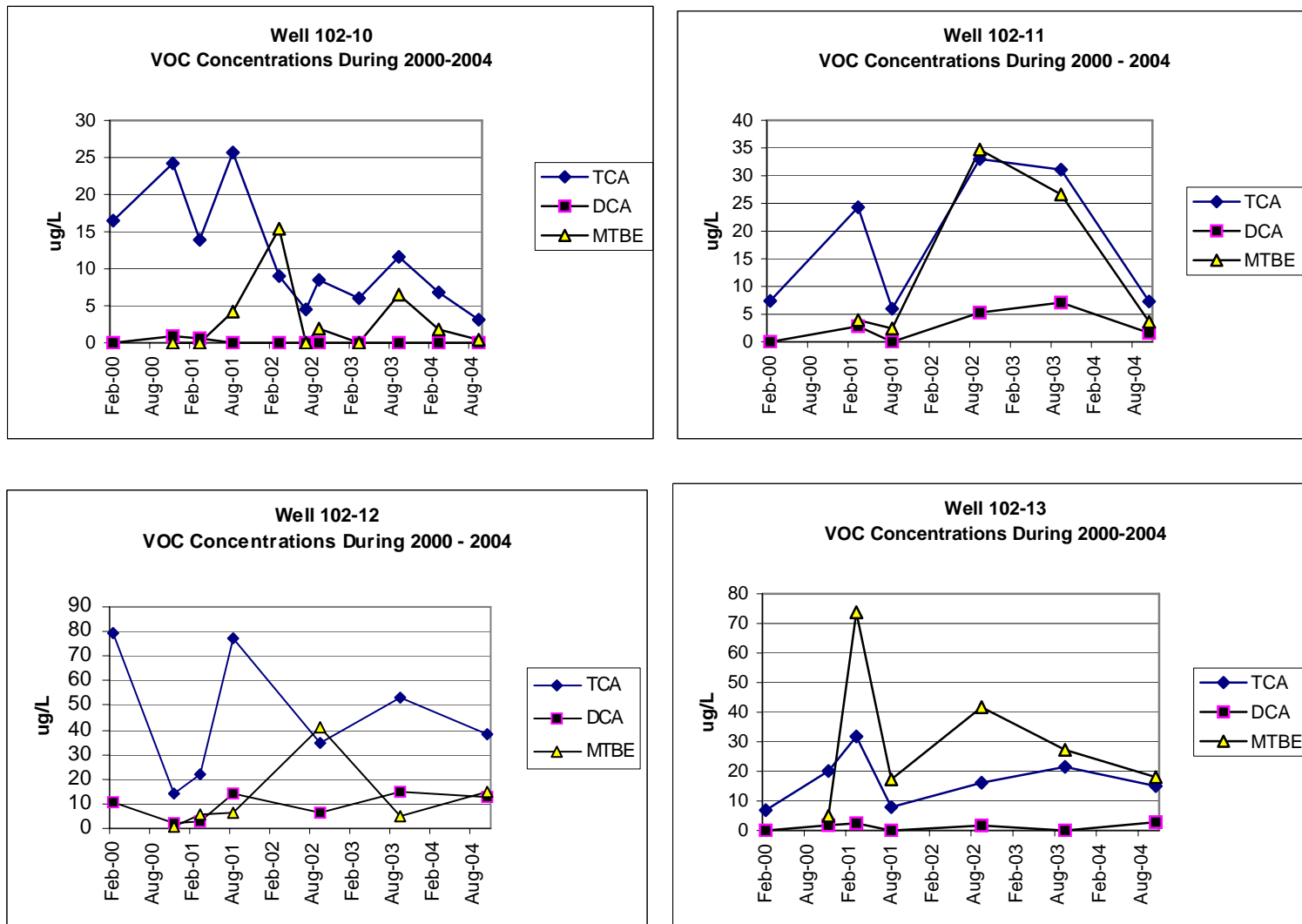


Figure 3. VOC Concentration Trend Plots for Monitoring Wells Downgradient of the Building 423/326 Area.